In the Claims:

Cancel claims 1-48 and insert the following new claims.

49. (New) At least one population, each said population comprising a plurality of specifically detectable metal-like light scattering particles,

wherein said particles comprise at least one metal-like light scattering material, and

wherein said particles have at least one additional material on their surfaces that provides chemical stability and specific binding to an analyte.

50. (New) The population of claim 49, wherein said material does not significantly interact with light in the visible region of the spectrum.

51. (New) The population of claim 50, wherein said at least one additional material comprises a protein, nucleic acid or peptide.

52. (New) The population of claim 50, wherein said at least one additional material comprises a polymer.

53. (New) The population of claim 50, wherein said at least one additional material is an organic compound or inorganic compound.

54. (New) The population of claim 50, wherein said at least one additional material comprises a metal.

55. (New) The population of claim 49, wherein said particles are spherical.

56. (New) The population of claim 49, wherein said particles are oval or ellipsoidal.

57. (New) The population of claim 49, wherein said particles are asymmetrical.

58. (New) The population of claim 49, wherein the coefficient of variation in size of said plurality of particles in a said population is less than 15%.

59. (New) The population of claim 49, wherein the coefficient of variation in size of said plurality of particles in a said population is less than 10%.

60. (New) The population of claim 49, wherein the coefficient of variation in size of said plurality of particles in a said population is less than 5%.

61. (New) The population of claim 49, wherein said particles comprise a surface coat of gold.

62. (New) The population of claim 49, wherein said particles comprise a surface coat of silver or silver alloy.

63. (New) The population of claim 49, wherein said particles comprise a metal.

64. (New) The population of claim 49, wherein said particles comprise gold.

65. (New) The population of claim 49, wherein said particles comprise a mixed composition of gold and silver.

66. (New) The population of claim 49, wherein said particles comprise gold and another metal-like material.

67. (New) The population of claim 49, wherein said particles comprise silver and another metal-like material.

68. (New) The population of claim 49, wherein said particles comprise gold and a non-metal-like material.

69. (New) The population of claim 49, wherein said particles comprise silver and a non-metal-like material.

70. (New) The population of claim 49, wherein said particles comprise silver and a magnetic or ferro electric material.

71. (New) The population of claim 49, wherein said particles comprise gold and a magnetic or ferro electric material.

72. (New) The population of claim 49, wherein said particles are composed of a mixture of metal-like materials and a magnetic or ferro electric material.

73. (New) The population of claim 49, wherein said particles are composed of silver and gold and a magnetic or ferro electric material.

74. (New) The population of claim 49, wherein said particles have a surface coating.

75. (New) The population of claim 74, wherein said surface coating is selected from the group consisting of polymer, protein, nucleic acid, and carbohydrate.

76. (New) The population of claim 49, wherein said particles comprise gold and have an average diameter between 10 and 45 nanometers inclusive.

77. (New) The population of claim 49, wherein said particles comprise gold and have an average diameter between 50 and 70 nanometers inclusive.

78. (New) The population of claim 49, wherein said particles comprise gold and have an average diameter between 80 and 120 nanometers inclusive.

79. (New) The population of claim 49, wherein said particles comprise gold and have an average diameter greater than 120 nanometers and less than one micrometer.

80. (New) The population of claim 49, wherein said particles comprise silver and have an average diameter between 5 and 50 nanometers.

81. (New) The population of claim 49, wherein said particles comprise silver and have an average diameter between 20 and 100 nanometers.

82. (New) The population of claim 49, wherein said particles comprise silver and have an average diameter between 10 and 200 nanometers.

83. (New) The population of claim 49, wherein said particles comprise silver and have an average diameter of 120 nanometers or less.

84. (New) The population of claim 49, wherein said particles comprise silver and have a diameter selected from the group consisting of 10, 20, 30, 40, 60, and 100 nm.

85. (New) The at least one population of claim 49, wherein said at least one population is two or more populations, and wherein the particles of each

population are different specifically detectable metal-like light scattering particles that specifically bind to different analytes.

86. (New) The two or more populations of claim 85, wherein said populations have size distributions with coefficients of variation less than 15%.

87. (New) The two or more populations of claim 85, wherein said populations have size distributions with coefficients of variation less than 10%.

88. (New) The two or more populations of claim 85, wherein said populations have size distributions with coefficients of variation less than 5%.

89. (New) A specifically detectable light scattering particle reagent comprising

a population of particles formed from at least one light scattering material selected from the group consisting of a metal, a metal compound, a metal oxide, a semiconductor, and a superconductor,

wherein said particles have an average diameter between 1 and 500 nanometers; and

at least one base molecule bound to the surface of said particle, wherein said base molecule is adapted to bind to a binding agent,

wherein said particle reagent specifically binds to an analyte.

90. (New) The particle reagent of claim 89, wherein said particles further have a stabilizing surface coat.

91. (New) The particle reagent of claim 90, wherein said stabilizing surface coat comprises a polymer.

92. (New) The particle reagent of claim 89, wherein said base molecule is bound to said binding agent.

93. (New) The particle reagent of claim 89, wherein said particles have a plurality of different base molecules bound on the surface of said particles.

94. (New) The particle reagent of claim 89, wherein said particles comprise a metal.

95. (New) The particle reagent of claim 89, wherein said particles comprise gold.

96. (New) The particle reagent of claim 89, wherein said particles comprise silver.

97. (New) The particle reagent of claim 89, wherein said particles have an additional material on the surface that does not significantly interact with light in the visible region of the spectrum.

98. (New) The particle reagent of claim 97, wherein said material on the surface is a protein, nucleic acid or peptide.

99. (New) The particle reagent of claim 97, wherein said material on the surface is a metal.

100. (New) The particle reagent of claim 89, wherein said particles are spherical.

101. (New) The particle reagent of claim 89, wherein said particles are oval or ellipsoidal.

102. (New) The particle reagent of claim 89, wherein said particles are asymmetrical.

103. (New) The particle reagent of claim 89, wherein said population has a coefficient of variation in size of said particles of less than 15%.

104. (New) The particle reagent of claim 89, wherein said population has a coefficient of variation in size of said particles of less than 10%.

105. (New) The particle reagent of claim 89, wherein said population has a coefficient of variation in size of said particles of less than 5%.

106. (New) The particle reagent of claim 89, wherein said particles comprise a mixed composition of gold and silver.

107. (New) The particle reagent of claim 89, wherein said particles comprise gold and another metal-like material.

108. (New) The particle reagent of claim 89, wherein said particles comprise silver and another metal-like material.

109. (New) The particle reagent of claim 89, wherein said particles comprise gold and a non-metal-like material.

110. (New) The particle reagent of claim 89, wherein said particles comprise silver and a non-metal-like material.

111. (New) The particle reagent of claim 89, wherein said particles comprise silver and a magnetic or ferro electric material.

112. (New) The particle reagent of claim 89, wherein said particles comprise gold and a magnetic or ferro electric material.

113. (New) The particle reagent of claim 89, wherein said particles comprise a mixture of metal-like materials and a magnetic or ferro electric material.

114. (New) The particle reagent of claim 89, wherein said particles comprise silver and gold and a magnetic or ferro electric material.

115. (New) The particle reagent of claim 89, wherein said particles comprise silver and have a diameter selected from the group consisting of 10, 20, 40, 60, and 100 nm.

116. (New) The particle reagent of claim 89, wherein said particles comprise gold and have an average diameter between 10 and 45 nanometers inclusive.

117. (New) The particle reagent of claim 89, wherein said particles comprise gold and have an average diameter between 50 and 70 nanometers inclusive.

118. (New) The particle reagent of claim 89, wherein said particles comprise gold and have an average diameter between 80 and 120 nanometers inclusive.

119. (New) The particle reagent of claim 89, wherein said particles comprise gold and have an average diameter greater than 120 nanometers and less than one micrometer.

120. (New) The particle reagent of claim 89, wherein said particles comprise silver and have an average diameter between 5 and 50 nanometers.

121. (New) The particle reagent of claim 89, wherein said particles comprise silver and have an average diameter between 20 and 100 nanometers.

122. (New) The particle reagent of claim 89, wherein said particles comprise silver and have an average diameter between 10 and 200 nanometers.

123. (New) The particle reagent of claim 89, wherein said particles comprise silver and have an average diameter of 120 nanometers or less.

124. (New) The particle reagent of claim 89, wherein said particles comprise silver and have a diameter selected from the group consisting of 10, 20, 30, 40, 60, and 100 nm.

125. (New) A multiparticle optical signal agent comprising

at least one particle formed of a magnetic or ferro electrical material, attached to

at least one metal-like particle.

126. (New) The multiparticle optical signal agent of claim 125, wherein at least one said metal-like particle comprises silver or gold.

127. (New) A method for making specifically detectable coated gold particles, comprising:

contacting a population of seed particle having a size between about 1 and 20 nanometers in diameter with a gold chloride solution and a hydroxylamine

hydrochloride solution under conditions in which the size of the resulting gold particles has a coefficient of variation of less than 10%; and

attaching a specific binding agent or a molecule for binding of a binding agent to said particles.

128. (New) The method of claim 127, wherein the size of said resulting gold particles has a coefficient of variation of less than 5%.

129. (New) The method of claim 127, wherein said resulting gold particles have a diameter of between 10 and 45 nanometers inclusive.

130. (New) The method of claim 127, wherein said resulting gold particles have a diameter of between 50 and 70 nanometers inclusive.

131. (New) The method of claim 127, wherein said resulting gold particles have a diameter of between 80 and 120 nanometers inclusive.

132. (New) The method of claim 127, wherein said resulting gold particles have a diameter of greater than 120 nanometers and less than one micrometer.

133. (New) The method of claim 127, wherein said seed particles are gold.

134. (New) The method of claim 127, wherein said seed particles are silver.

135. (New) A method for making specifically detectable coated silver particles, comprising:

contacting a population of seed particle with a silver salt solution under conditions such that silver is deposited on said seed particles; and

attaching a specific binding agent or a molecule for binding of a binding agent to said particles.

136. (New) The method of claim 135, wherein said seed particles are gold.

137. (New) The method of claim 135, wherein said seed particles are silver.

138. (New) The method of claim 135, wherein the resulting particles have an average diameter of 20-100 nm.

139. (New) The method of claim 135, wherein the resulting particles have an average diameter of 10-200 nm.

140. (New) The method of claim 135, wherein the size of the resulting particles has a coefficient of variation of less than 15%.

141. (New) The method of claim 135, wherein the size of the resulting particles has a coefficient of variation of less than 10%.

142. (New) The method of claim 135, wherein the size of the resulting particles has a coefficient of variation of less than 5%.

143. (New) A test kit, comprising

a plurality of at least one type of metal-like light scattering particles, wherein the particles are between 1 and 500 nm in diameter, and wherein different particle types, when present, are adapted to bind to different analytes; and

a solid phase array comprising a plurality of binding agents bound at a plurality of spatially addressable spots.

144. (New) The kit of claim 143, wherein said plurality of binding agents bind to a plurality of different analytes.

145. (New) The kit of claim 144, wherein said plurality of binding agents comprises a plurality of nucleic acid molecules.

146. (New) The kit of claim 144, wherein said plurality of binding agents comprises a plurality of antibodies.

147. (New) The kit of claim 144, wherein said plurality of binding agents comprises a plurality of receptors.

148. (New) The kit of claim 144, wherein said plurality of binding agents comprises a plurality of proteins.

149. (New) The kit of claim 144, wherein said plurality of binding agents comprises a plurality of peptides.

150. (New) The kit of claim 144, wherein said plurality of binding agents comprises a plurality of pharmaceutical agents.

151. (New) The test kit of claim 143, wherein said at least one metal-like light scattering particle type comprises a plurality of distinguishable particle types.

152. (New) The test kit of claim 143, wherein said at least one metal-like light scattering particle type comprises a plurality of distinguishable metal light scattering particle types.

153. (New) The test kit of claim 152, wherein each of said plurality of different particle types provides a different color of scattered light on illumination with white light.

154. (New) The test kit of claim 143, wherein the particles of a particle type have on their surfaces a binding agent that binds to an analyte.

155. (New) The test kit of claim 143, wherein the particles of a particle type are adapted to indirectly bind to an analyte.

156. (New) The test kit of claim 143, wherein the particles of a particle type comprise gold.

157. (New) The test kit of claim 143, wherein the particles of a particle type comprise silver.

158. (New) The test kit of claim 143, wherein the particles of a particle type comprise gold and silver.

159. (New) A test kit, comprising

a plurality of populations of different distinguishable metal-like light scattering particle types, wherein the particles are between 1 and 500 nm and different particle types are adapted to bind to different analytes.

160. (New) The test kit of claim 159, wherein the particles of a particle type comprise a binding agent that binds to an analyte.

161. (New) The test kit of claim 159, wherein the particles of a particle type are adapted to indirectly bind to an analyte.

383

384 162. (New) The test kit of claim 159, wherein the particles of a particle
385 type comprise gold.

386

387 163. (New) The test kit of claim 159, wherein the particles of a particle
388 type comprise silver.

389

390 164. (New) The test kit of claim 159, wherein the particles of a particle
391 type comprise gold and silver.

392

393 165. (New) The test kit of claim 159, wherein each of said plurality of
394 populations of different particle types provides a different color of scattered light on
395 illumination with white light.

396